Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	EB Docket No. 04-296
Review of the Emergency Alert System	)	

COMMENTS OF THE CONSUMER ELECTRONICS ASSOCIATION

The Consumer Electronics Association ("CEA")[1] submits these comments in response to the Commission's Notice of Proposed Rulemaking ("NPRM") in the above-captioned proceeding. The Commission initiated this proceeding to examine how the Emergency Alert System ("EAS") might be improved to be a more effective mechanism for warning the public of emergency situations.[2]

EAS and NOAA Weather Radio ("NWR"), the two systems that distribute emergency alerts to the public, complement each other to ensure wide distribution of critical emergency information. The Commission's examination of improvements to EAS should consider the

[1] The Consumer Electronics Association is the principal U.S. trade association of the consumer electronics and information technologies industries. Our members design, manufacture, distribute and sell digital and analog television receivers, monitors and associated electronics such as digital video recorders ("DVRs"), video cassette recorders ("VCRs"), direct broadcast satellite radios ("DARS"), satellite television receivers ("DBS"), broadcast AM and FM radios, and similar products. Our members also design and manufacture unlicensed devices such as Wi-Fi network devices that connect personal computers, personal digital assistants ("PDAs") and laptops to peripheral devices and networks, cordless phones, baby monitors, and wireless headsets. CEA's more than 1,700 member companies include the world's leading consumer electronics manufacturers.

[2] *See Review of the Emergency Alert System,* Notice of Proposed Rulemaking, 19 FCC Rcd 15775 (2004).

context of emergency alert dissemination generally, and the role of NWR in particular. Closer integration of EAS and NWR would improve public awareness of these facilities and quicken the dissemination of critical emergency information. Consumers employ a variety of receiver types to listen to EAS and NWR signals, and a recent CEA voluntary initiative reached agreement on specific receiver functions that provide common functions in all radios using the Public Alert™ label. This type of voluntary activity and flexible standard is more conducive than rigid FCC mandates and rules to maintaining state-of-the-art emergency systems at a time of significant technological change.

INTRODUCTION AND STATEMENT OF INTEREST

CEA's members manufacture a wide range of consumer equipment that is used to receive EAS and NWR emergency alerts. While in the NPRM the Commission focuses on delivery of EAS by the broadcast, cable, and wireless cable services, the full picture includes emergency alerts broadcast by the radio network that is maintained by the National Oceanographic and Atmospheric Administration's ("NOAA") National Weather Service ("NWS"). Although still called NOAA Weather Radio, in cooperation with the Federal Emergency Management Agency ("FEMA") and the Department of Homeland Security this network broadcasts almost all emergency alerts[3] and reaches all but the very sparsely populated areas of the country.[4] There also is a similar, compatible system in Canada.

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[3] *See* CEA, Press Room, *CEA Welcomes DHS and NOAA Public Alert™ Memorandum of Agreement*, June 17, 2004, at Appendix II.

[4] *See* coverage map at Appendix III.

Commission consideration of improvements to EAS should take into consideration the context of emergency alert dissemination more generally. Closer integration of EAS and NWR, would improve public awareness of these facilities and increase the speed with which the public is likely to hear the critical life saving emergency information. Many more people would hear critical life saving alerts in a timely manner with improved public awareness and better integration of the two systems.

Consumers employ a variety of receiver types to access emergency alert broadcasts by EAS and NWR. Our members manufacture receivers that generally monitor the channels and others which activate automatically with the alert transmissions broadcast over the NOAA network triggered by a 1050 Hz tone or by decoding the digital data stream. Our members also manufacture the televisions and radios that receive EAS alerts carried by broadcasters, cable operators, and wireless cable systems. As described below, a recent CEA voluntary initiative resulted in agreement on specific functions for receivers and prescribed a Public Alert™ label for compliant equipment to assist consumers desiring specific features. This effort is expected to substantially increase the number of consumers receiving emergency alert information[5] and consumer products will continue to improve in response to marketplace demands as technological innovation progresses and awareness of these capabilities increases.

COMPARATIVE BACKGROUND ON EAS AND NWR EMERGENCY ALERT SYSTEMS

Two principal Public Alert™ delivery methods currently notify the public to emergency situations. EAS is one delivery system. It uses private television stations, radio stations, cable

[5] *See PUBLIC ALERT™: Delivers Emergency All-Hazard Warnings, Everywhere, All the Time,* at Appendix I.

systems, and wireless cable systems to relay emergency alerts to the public. The other delivery system is NWR. It utilizes more than 900 government owned and operated transmitters located throughout the United States and territories to directly transmit emergency information. Unlike the broadcast EAS system, which relies upon staff to hear and decide whether to broadcast information about state and local alerts, the NWR system delivers emergency alerts directly to the public equipped with a relatively inexpensive receiver.

- Most alerts that are issued over both EAS and NWR originate from NOAA managed personnel and offices.

- While both EAS and NWR use the same alerts[6] except for a Presidential Emergency Action Notification issued through EAS, there has never been such an alert. There is no EAS command center and no government personnel comparable to the operations of the NWR system.

- Government agencies such as FEMA, NOAA, the U.S. Geological Survey's Earthquake Information Center, and each of the state Governors Command Centers provide emergency alert data. EAS entities can edit emergency alert information and independently decide whether to broadcast it, and therefore EAS is an indirect delivery method except when Presidential information is being conveyed. By comparison, the NWR system broadcasts directly to the public without edits, removals, or commentary the same information that EAS stations receive.

- The NWR system broadcasts alerts to consumers with appropriate radios, typically within 7-10 seconds of receiving the alert code. By comparison, the EAS delivery system, due to the necessity of interrupting commercial broadcasting, passes on only some of the alerts on a case-by-case basis.

CEA'S PUBLIC ALERT™ PROGRAM

CEA's Public Alert™ Technology Alliance ("PATA"), comprised of product manufacturers and government representatives working in a voluntary cooperative venture,

[6] The alert codes are specified at 47 C.F.R. § 11.31.

recently adopted voluntary uniform requirements for consumer receivers that display the Public Alert™ logo and receive emergency alert NWR broadcasts.[7] This effort demonstrates that voluntary cooperation results in state-of-the-art capabilities being made available to the public in a manner that maintains the flexibility to adopt changes as technologies and services evolve in the future.

Voluntary efforts such as those of CEA ensure up-to-date capabilities using the NWR transmitters as a backbone. Like the proliferating products that use the location signals from the Global Positioning System ("GPS"), the consumer electronics industry will design state-of-the-art products around the NWR network. Unique implementations and variations will be designed to meet the needs and desires of consumers.

The NWR and EAS systems complement each other and both should continue to be maintained by the Government. They are important components of alerting the public to emergency situations, and enable private industry to utilize its talents and resources to provide derivative products to the public under the type of competitive situation that fosters innovation and improvement.

Public Alert™ receivers certified to comply with voluntary standard CEA-2009 respond to the digital data included in NWR emergency alerts that identify the type and location of emergency. This allows Public Alert™ radios in sleep mode to wake up and both play and display emergency alerts that can be targeted to the user's geographic community, language, and customized for select alert needs. Reducing false alarms minimizes the chances that consumers

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[7] *See* Dave Wilson, CEA, *New Industry Standard for Public Alert Receivers,* first presented at the April 2004 NAB Broadcast Engineering Conference, at Appendix IV.

will deactivate the radio to eliminate announcements that are not of interest or ignore repeated warnings.

The CEA Public Alert™ receiver performance standard is described in detail in Appendix I. The program is in place and will be further developed as new needs and capabilities occur. The system is flexible, and can change with future developments and technology as needed, and devices already are reaching the public.

Public Alert™–certified devices have the following benefits, some of which are shared with other NWR receivers.

- 100% alert transmission and reception compatibility throughout the United States, its territories, and along the U.S.-Mexico and U.S.-Canada borders.
- Using existing government transmitters, Public Alert™ devices can be used by 97% of the U.S. population and an estimated 92% of the Canadian population by April 2005. The system is managed and operated on a 24-hour-a-day basis by government employees and designed for operation during emergency and severe weather events.
- Activate upon the same alerts delivered through the EAS delivery system but also offer additional alert activations for future options, as well as alerts for use in international waters and Canada.
- Provide automatic translation for all alerts into multiple language text, including those unique to Canada. These are the first devices to provide an accepted standard for text in English, Spanish and French.
- Most Public Alert™ devices display text.
- Uniform alert technology for the hearing impaired: Public Alert™ devices also provide four flashing and/or stationary light indicators of different colors visible from at least 15 feet.
- Rapid response to digital data alert triggering signals generally occurs within 7-15 seconds from reception of the transmission, as the units decode the digital data and process the geographic and alert data.

- An analog voice channel is available, which includes 24-hour continuous information and can be used to provide the vocal alert message to notify persons with vision disabilities.

- Incorporates "Specific Area Message Encoding" ("SAME"), which allows the device to respond only when an alert matches the specific area(s) the user has chosen for alert coverage.

- In both Public Alert™ receivers and Public Alert™ integrated televisions, 100% notification to consumers is ensured because the integrated Public Alert™ device is autonomous of any other signal input. Thus, notification is ensured regardless of whether the user is listening to cable, satellite, broadcast or recorded media. This is achievable with a dedicated tuner monitoring the NWR digital data transmission stream.

- Silent triggering available for tests, including all weekly and monthly tests. This allows Public Alert™ devices to be constantly active, monitoring and ready to trigger only when required.

- The devices trigger alarms when turned "off" if user wishes. Many units have options to respond with variable volume chimes, sirens or electronic voice modes to provide alert details and on-screen expanded text. Televisions with Public Alert™ capability will alert regardless of the whether in stand-by ("off"), displaying programming, or using an external device such as a VCR, DVD player, or video game.

- 100% of the information transmitted will be received and evaluated, with options for the consumer to tailor and customize alert choices including silence mode for specific non-critical alerts. Even if a consumer selects the silent mode for a non-critical event, indicators will operate and provide notice of an incoming warning visually throughout the duration of the alert, with the option for the user to check.

- Decoding process automatically classifies the severity of all alerts and messages. For example, an Emergency Activation Notification would display uniformly on all devices as a warning and light a red indicator.

- Reception of NWR transmissions used in Public Alert™ devices allow and are compatible with many proposals to use a 'Common Alert Protocol' for improved alert delivery from local and regional EAS participants.

CONCLUSION

Two systems exist that distribute emergency alert information: EAS and NWR. EAS is media-based, and since only Presidential emergency announcements must be carried, in practice its use is voluntary and usually is employed for state and local-level emergency announcements. By contrast, NWR is operated by NOAA, a source of government-issued emergency announcements that are transmitted directly to the public using receivers readily available in the consumer marketplace with a variety of features.

NWR and EAS complement each other. Each helps to disseminate critically needed information and should continue to do so. NWR carries almost all alerts and the public has full or selective access with many different options by employing different types of receivers. General receivers that monitor the NWR channel are desired by some, but there also is a substantial demand for radios that "wake up" and alert listeners when certain types of messages are broadcast. CEA has worked with industry and Government to adopt the CEA-2009 voluntary standard to assist in making selective call radios available in a manner understood by the public. The continued availability of these and other types of receivers in the competitive marketplace ensures that the public requirements will be met in a timely manner as driven by consumer demand.

In contrast to the EAS and NWR services themselves, the Commission's suggestion for mandatory standards on equipment[8] would disserve the public interest. With technology ever more rapidly changing, only marketplace forces have the agility needed for manufacturers to adjust in a timely fashion to consumer needs and technological improvements. Particularly with

[8] *See* NPRM at ¶ 35.

regard to emergency alerts, FCC standards or other edicts are likely to be outmoded soon after adoption given that the rulemaking process often is longer than the life cycle of technologies. Manufacturers will adjust their products in response to marketplace demands, and with increased public attention on security alerts, new equipment and functionalities will appear built upon the EAS/NWR foundation. Just as new applications and equipment continually appear for GPS receivers without an FCC mandate, so too we expect that the increased security consciousness of the public will result in better equipment employing new technologies and functionalities.

Respectfully Submitted,

CONSUMER ELECTRONICS ASSOCIATION

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APPENDICES

APPENDIX I: *PUBLIC ALERT: Delivers Emergency All-Hazard Warnings, Everywhere, All the Time* (CEA's Public Alert White Paper)

APPENDIX II: CEA, Press Release, *CEA Welcomes DHS and NOAA Public Alert Memorandum of Agreement*

APPENDIX III: NOAA Weather Radio Information

APPENDIX IV: New Industry Standard for Public Alert Receivers

APPENDIX I

APPENDIX I: *PUBLIC ALERT: Delivers Emergency All-Hazard Warnings, Everywhere, All the Time* (CEA's Public Alert White Paper)

PUBLIC ALERT: Delivers Emergency All-Hazard Warnings, Everywhere, All the Time

Public Alert™

CEA
Consumer Electronics Association

Public Alert

In November 2002, the National Oceanic and Atmospheric Administration (NOAA) and National Weather Service (NWS) contacted the Consumer Electronics Association (CEA) to determine if CEA had any interest in joining with NWS in developing a national standard for NOAA Weather Radio (NWR) receivers. In February 2003, the CEA and NWS convened a discovery group of interested parties to investigate the need for a new standard for NWR receivers. By the end of February 2003, CEA's R3 committee had approved the development of a voluntary industry standard defining minimum performance criteria for consumer electronics products designed to receive Specific Area Message Encoding (SAME) alert signals broadcast by the NWR network and Environment Canada's Meteorological Service of Canada Weatheradio network.

In December 2003, the CEA Standard, *Receiver Performance Specification for Public Alert Receivers,* (CEA-2009), was approved by the Audio Systems Committee. A CEA Special Interest Group – an alliance of interested manufacturers and government agencies – created the corresponding Public Alert™ Certification and Logo Program and identified April 5, 2004 as the official launch date for the initiative. Members of the alliance include manufacturers and marketers of Public Alert devices, NOAA, NWS, Environment Canada and the CEA.

The purpose of the Public Alert program is to draw attention to new and existing devices and establish standards to improve public confidence in those devices. The CEA Public Alert Certification logo will appear on products at retail stores beginning in April 2004. The certification and technical standards for industry-defined Public Alert devices have been approved by key federal agencies in the U.S. and Canada.

PUBLIC ALERT DEFINITION

CEA defines Public Alert as a consumer electronics product providing direct access to government emergency information 24-hours-a-day, with the ability to automatically prompt users with various types of audio and visual cues. The products are sophisticated enough to recognize specific alerts for specific geographic regions, while monitoring emergency conditions at the state and

national levels. All CEA-2009 certified Public Alert devices meet the CEA standard for compatibility and certification, and receive free public broadcasts from NOAA Weather Radio network and Environment Canada's Meteorological Service of Canada Weatheradio network.

PUBLIC ALERT FEATURES & BENEFITS

- To awaken people, Public Alert devices can provide audible alarms 24-hours-a-day as soon as an alert is issued.
- Public Alert broadcasts are commercial-free providing on-demand, local, 24-hour weather information in addition to alerts.
- Public Alert devices can be tailored to respond to alerts for any of the thousands of specific areas in the U.S. and Canada.
- Public Alert devices can provide a variety of alert options, including lights, text messages, voice information, sirens and/or means to activate peripheral alerting mechanisms. The variety of alarms available is particularly important for individuals with disabilities.
- Tests of the government transmission networks can be received by Public Alert devices without the annoyance or the public perception of "false" alarms.
- Public Alert devices are triggered by warnings received directly from government sources. Emergency Alert Systems (EAS) used by AM, FM and television broadcasters can experience delays in transmission.
- Public Alert certified devices are capable of responding to the most recent event codes proposed by the FCC in February 2002, all the codes established by the National Weather Service, and all codes being implemented by Environment Canada in June 2004.
- Public Alert certified devices must meet minimum requirements for reception sensitivity ensuring a consistently high level of performance and the delivery of quality products to consumers.

Public Alert Advantages

The American and Canadian public receive government alerts in a variety of ways. In many areas, local authorities issue alerts by activating outdoor sirens that are designed to warn people in the immediate vicinity of the alert.

Citizens that are inside buildings or not close to a siren can receive alerts either directly from a Public Alert device or indirectly from commercial broadcast media, which in the U.S. relies primarily on EAS.

EAS has evolved from two earlier warning systems known as the Control of Electronic Radiation (CONELRAD) and the Emergency Broadcast System (EBS) over the last 50 years. Although it is mandated for all radio, television and cable stations by the Federal Communications Commission (FCC) and operated under the auspices of a state level EAS organization, it is completely controlled by local and network broadcasters. With the single exception of mandatory activation for national security warnings, activation for other alerts is voluntary and controlled by local broadcast station management.

A citizen relying on commercial broadcast media for alerts must be tuned into a radio or television station that has chosen to broadcast the particular alert at the precise moment it is transmitted. In addition, the citizen must be awake and aware at the time of transmission.

Public Alert devices, on the other hand, receive alert messages directly on dedicated radio frequencies from the government sources (both in Canada and the U.S.) responsible for issuing alerts of impending life threatening events. Government-owned networks are dedicated to delivering alerts without commercials. These network broadcasts can be received on special consumer radios, televisions, and other electronic devices capable of automatically triggering alarms 24-hours-a-day. The network in the U.S. is called NWR, and in Canada is called the Weatheradio network. Public Alert devices certified by CEA are among those receiving these direct government network transmissions.

The primary advantage of owning a Public Alert device is the peace of mind that comes from knowing that all alert messages will auto-

matically activate the device and prompt some kind of immediate life-saving alert. The devices can even provide alerts when a household is asleep. In the case of devices integrated into other electronics, Public Alert-equipped devices provide visual and/or audible alarms that allow the user to also play video games, watch a DVD disc or VHS tape, listen to the radio or watch television.

Public Alert devices come in a wide variety of models, with many options and functions, including adjustable sirens, visual readouts, silent visual modes, chimes, and voice information. Public Alert devices are based on digital data decoding technologies, which allows alerts to be triggered through alert-capable bedside radios, home security systems, televisions, and phones. The list of current and potential Public Alert integrated products continues to grow.

The devices provide alerts in all 50 states and all U.S. territories. Some models are customized for coverage in Canada, or operate in both countries.

Colored warning indicators show whether the alert is an advisory message or statement, a watch, or an immediate warning. Public Alert devices also allow users to instantly monitor local weather forecasts 24-hours-a-day from the commercial-free NWS or Environment Canada transmissions.

Unlike EAS, these transmitted alerts provide digital data directly to the consumer reception device instantly triggering Public Alert devices that are listening for their specific local alerts. Public Alert devices often receive alerts minutes before TV and radio broadcasters choose to relay an alert to their broadcast area.

Combined with almost 900 transmitters throughout the 50 states and U.S. territories, and over 180 in Canada, an estimated 95 percent of the public is now covered by the government operated public network. Public Alert devices receive alerts directly from the government transmitter, the same official sources that often provide the alert information to the media.

Exhibit 1 (see page 3) compares the level of protection offered by each method:

EXHIBIT 1 PUBLIC ALERT VS. EAS

	Relying on broadcast media which depends on the EAS system	Relying on a Public Alert device
Is the consumer always able to monitor alerts?	**NO.** Only when listening to stations participating in alerts at the time. Few cable or satellite stations provide local emergency coverage.	**YES.** Monitors emergency channels directly and independently. Commercial free coverage is dedicated to alert information as a first priority.
Capable of triggering an alert even when in a silent mode (i.e. "off" and in stand-by).	**NO.**	**YES.** Capable of "turning on" to issue an alert.
Managed and operated by government personnel.	**NO.** Volunteer and media personnel re-issue alerts.	**YES.** All information and alerts issued directly by government personnel.
Operates 24-hours-a-day.	**NO.** Only during operational times of specific participating station or media outlet.	**YES.** Monitors 24/7.
Mandatory broadcast interrupt.	**NO.**	**YES.**
Can be set to trigger alerts by selecting specific areas of coverage (like counties).	**NO.** Designed to pass on alerts for an entire coverage area of the commercial station or media.	**YES.** Allows alert triggering by county or counties. Even monitors multiple alerts simultaneously.
All information passed on.	**NO.** Stations can choose to ignore all but a single national threat warning, and either delay announcement or avoid issuing all others.	**YES.** 100 percent of information received, and options to tailor and customize alert choices are available on most models.
Selectable alerting method.	**NO.** Audio only.	**YES.** User can choose audio and/ or visual display. Many models allow for optional strobe light and/or vibration alerts for hearing impaired.
Allows activation at levels other than Warnings.	**NO.**	**YES.** User can program to receive choice of alerts for watches and advisory statements.
Warning signal remains visible until expiration.	**NO.**	**YES.**
Active national field management personnel.	**NO.**	**YES.**
Number of alert events capable of being decoded (including optional messages).	**49**	**62** *(as shown below, plus optional codes)*
Receivers under single technical standard.	**NO.**	**YES.** Certification under CEA 2009.

EVENTS RECOGNIZED BY PUBLIC ALERT DEVICES

As of the date of this document, CEA Public Alert certified devices have the ability to recognize the following messages:

- 911 Telephone Outage Emergency
- Avalanche Warning
- Avalanche Watch
- Biological Hazard Warning
- Blizzard Warning
- Boil Water Warning
- Chemical Hazard Warning
- Child Abduction Emergency
- Civil Danger Warning
- Civil Emergency Message
- Coastal Flood Warning
- Coastal Flood Watch
- Contagious Disease Warning
- Dam Break Warning
- Dam Watch
- Dust Storm Warning
- Earthquake Warning
- Emergency Action Notification
- Emergency Action Termination
- Evacuation Watch
- Fire Warning
- Flash Flood Watch
- Flash Flood Statement
- Flash Flood Warning
- Flash Freeze Warning
- Flood Statement
- Flood Warning
- Flood Watch
- Food Contamination Warning
- Freeze Warning
- Hazardous Materials Warning
- Hurricane Statement
- Hurricane Warning
- Hurricane Watch
- High Wind Warning
- High Wind Watch
- Iceberg Warning
- Immediate Evacuation
- Industrial Fire Warning
- Land Slide Warning
- Law Enforcement Warning
- Local Area Emergency
- Nuclear Power Plant Warning
- Power Outage Advisory
- Radiological Hazard Warning
- Shelter In-Place Warning
- Special Marine Warning
- Special Weather Statement
- Severe Thunderstorm Warning
- Severe Thunderstorm Watch
- Severe Weather Statement
- Tornado Warning
- Tornado Watch
- Tropical Storm Warning
- Tropical Storm Watch
- Tsunami Warning
- Tsunami Watch
- Volcano Warning
- Wild Fire Warning
- Wild Fire Watch
- Winter Storm Warning
- Winter Storm Watch

SOURCES FOR PUBLIC ALERT

NWR in the U.S.

Public broadcasting of weather information, including severe weather warnings, had its inception in the 1950s when the Weather Bureau operated two stations broadcasting aviation weather. By 1976, there were 112. Between 1976 and 1979, federal funding was made available and 220 additional stations were added to establish what is currently known as NWR.

Although federal funding was terminated in the late 1970s, the network grew to about 400 stations by 1994 as a result of station donations by private interest groups. By October 2000, over 160 new stations had been added to the network through NWS public / private partnerships. Today, there are 884 stations broadcasting on the NWR network covering about 97 percent of the population.

During this period, NWS implemented SAME on the NWR network to allow automatic triggering of NWR receiver alarms in homes and the EAS on all radio and TV broadcasts for specifically defined, user selected, preprogrammed locales and events.

The NWS estimates that nearly 100 additional NWR stations are required to meet the goal of at least 95 percent population coverage in every state. There are currently 14 states with less than 95 percent coverage.

The NOAA/NWS/NWR infrastructure for collecting and disseminating alerts is the only currently available telecommunications infrastructure capable of effectively supporting a national warning network. In 2003, Federal Emergency Management Agency (FEMA) designated NWR as an "All-Hazards" network for alerts.

Public Alerting in Canada

In 1976, Environment Canada Weatheradio's service was launched and expanded to 30 locations in roughly 10 years. In the early-1990s, increased government investment permitted major expansion of the network to the present size of 185 sites.

In 1992, the network added the functionality of transmitting a data burst that was embedded in the audio signal. This service was called Weathercopy and focused on clients who required hard copies of weather warnings or desired hard copy custom weather products. In addition, the Weathercopy receivers were addressable and could be targeted to receive special weather forecast products and graphics. Dissemination technology evolved and similar, faster, delivery solutions were available to key clients, thus leading to the Weathercopy service being decommissioned in 2003.

Currently, there are six major weather offices in Canada that share the responsibility to ensure that all weather forecasts and warnings are broadcasting at each Weatheradio location. The Weatheradio network has 185 transmitter sites and approximately 92 percent of Canadians can access the Weatheradio signal.

In January 2004, the Minister of Environment Canada announced the Weatheradio network would add SAME functionality. The entire network conversion is expected to take one year but selected sites will begin broadcasting the codes by fall 2004. Environment Canada is partnering with Industry Canada to develop the protocol for the delivery of non-weather alert messaging, which will be established by 2005.

About CEA:

The Consumer Electronics Association (CEA) is the preeminent trade association promoting growth in the consumer technology industry through technology policy, events, research, promotion and the fostering of business and strategic relationships. CEA represents more than 1,500 corporate members involved in the design, development, manufacturing, distribution and integration of audio, video, mobile electronics, wireless and landline communications, information technology, home networking, multimedia and accessory products, as well as related services that are sold through consumer channels. Combined, CEA's members account for more than $90 billion in annual sales. CEA's resources are available online at www.CE.org, the definitive source for information about the consumer electronics industry.

CEA also sponsors and manages the International CES – Defining Tomorrow's Technology. All profits from CES are reinvested into industry services, including technical training and education, industry promotion, engineering standards development, market research and legislative advocacy.

About CEA's Public Alert Special Interest Group:

Formed in 2003, the CEA Public Alert Special Interest Group is working to promote the life-saving benefits of Public Alert-equipped devices. CEA thanks the members of the Public Alert Special Interest Group for their assistance in producing this white paper.

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APPENDIX II

APPENDIX II: CEA, Press Release, *CEA Welcomes DHS and NOAA Public Alert Memorandum of Agreement*

Press Room

FOR RELEASE

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CEA Welcomes DHS and NOAA Public Alert Memorandum of Agreement
Public Alert Warning Process To Be Streamlined Allowing 24-7 National Warning Capability To Certified Devices

Arlington, Virginia 6/17/2004

The Memorandum of Agreement (MOA) announced today by the Department of Homeland Security (DHS) and the National Oceanic and Atmospheric Association (NOAA) will result in a new, more efficient method for issuing local and national warnings and increase the value and effectiveness of Public Alert devices, said the Consumer Electronics Association (CEA). Under today's agreement, DHS will have round-the-clock access to the NOAA All-Hazards Network, allowing emergency alerts related to homeland security to reach the American public via Public Alert devices.

"Faster notification results in safer consumers," said CEA President and CEO Gary Shapiro. "The consumer electronics industry has shown tremendous commitment to this technology, devoting extensive resources to ensuring that our products, from radios to televisions to mobile phones, are able to receive Public Alert signals. The DHS-NOAA agreement will make Public Alert devices even more valuable to the consumer in the event of a local or national emergency."

Public Alert is a sophisticated outgrowth of the Emergency Alert System (EAS) through which warnings are broadcast at the discretion of the individual local and network broadcasters. In contrast, Public Alert devices provide commercial-free, on demand, local and national alert information 24 hours a day, and are triggered by warnings received directly from government sources. Since 2003 CEA and NOAA have collaborated on related industry standards and a corresponding Public Alert Certification and Logo Program for consumer electronics products equipped to receive the emergency messages.

The new government agreement also streamlines the warning notification process by enabling DHS to reach one NOAA operational center, which will then notify via satellite all 122 NOAA forecast offices simultaneously - rather than the current time and labor intensive process of notifying each office by phone or email. NOAA forecast offices would then activate transmitters tied to EAS, sounding the alert in Federal Emergency Management Agency (FEMA) offices, government offices, and Public Alert certified consumer devices owned by American consumers.

In December 2003, CEA and its R3 Audio Systems Committee released CEA-2009, the "Receiver Performance Specification for Public Alert Receivers," which establishes voluntary industry standards for consumer electronics products designed to receive digital Public Alert signals. Following that standards-setting process, CEA also established a Public Alert certification and logo program that started appearing on products this spring.

More information about the features and benefits of Public Alert devices is available in a recently released CEA white paper titled "Public Alert: Delivers Emergency All-Hazard Warnings, Everywhere, All the Time." To obtain a copy, please contact Jenny Miller at jmiller@ce.org.

About CEA:
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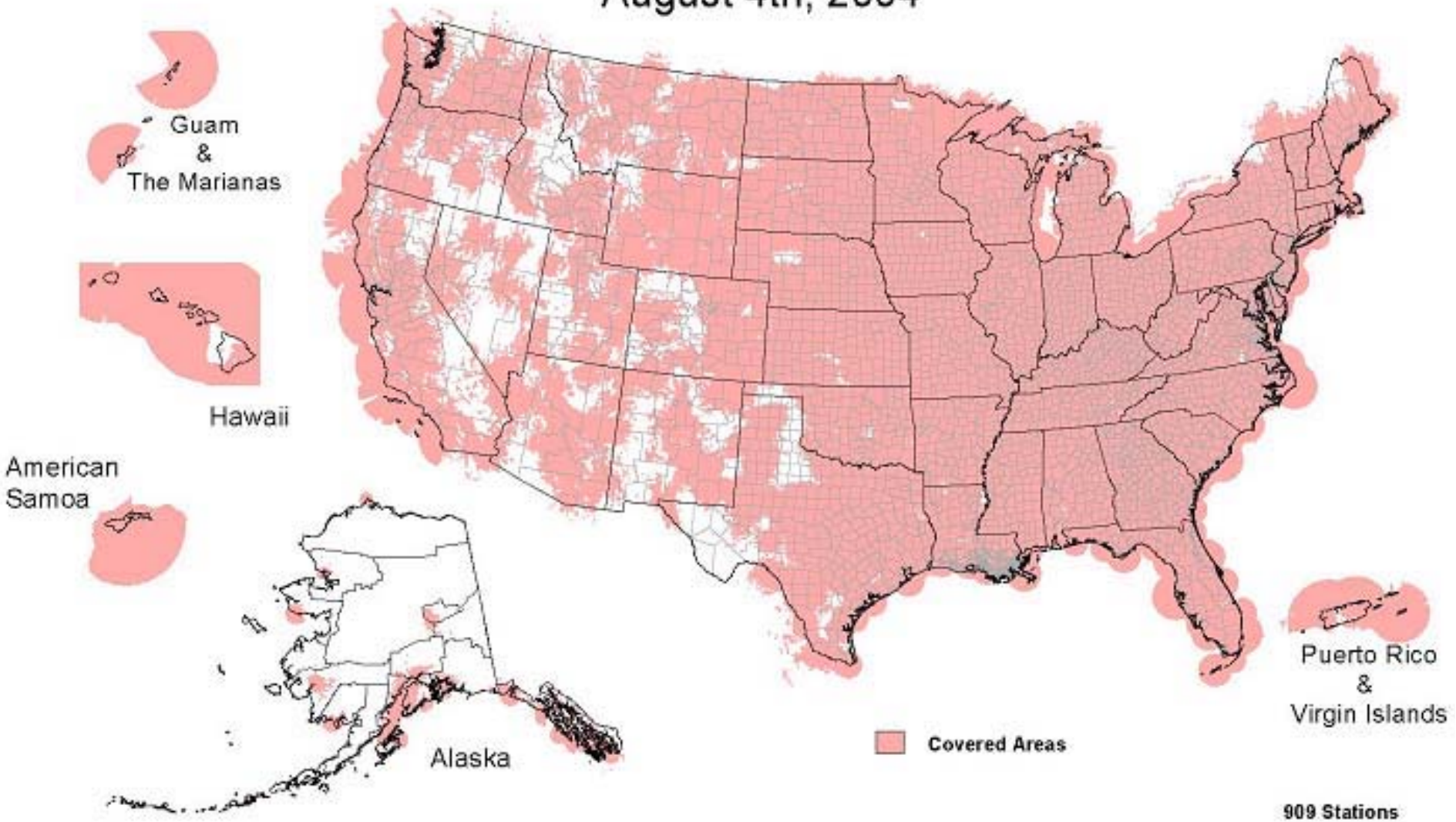
CEA also sponsors and manages the International CES - Defining Tomorrow's Technology. All profits from CES are reinvested into industry services, including technical training and education, industry promotion, engineering standards development, market research and legislative advocacy.

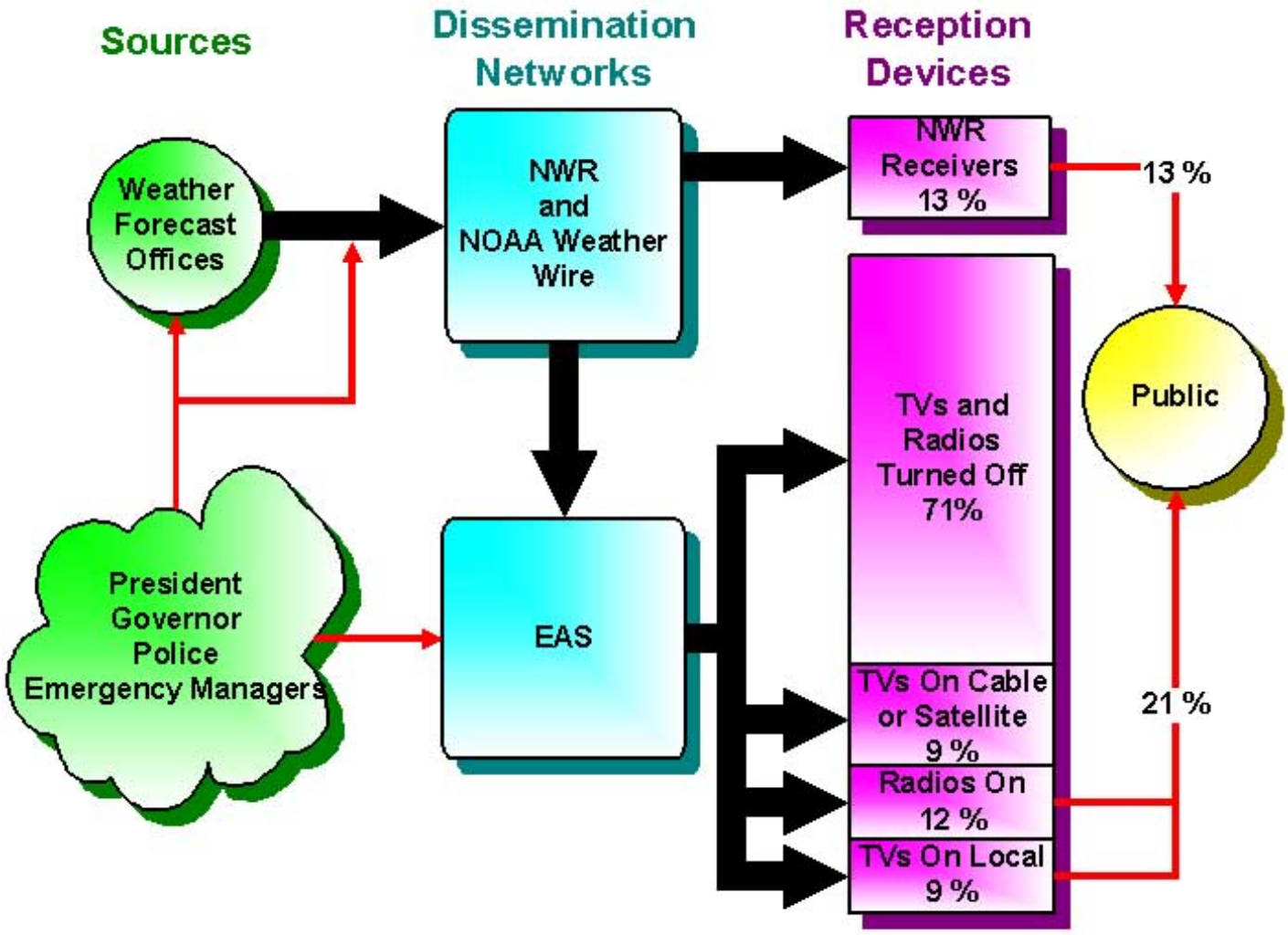
APPENDIX III

NOAA Weather Radio Information

NOAA Weather Radio RF Coverage
August 4th, 2004



Alert System Today



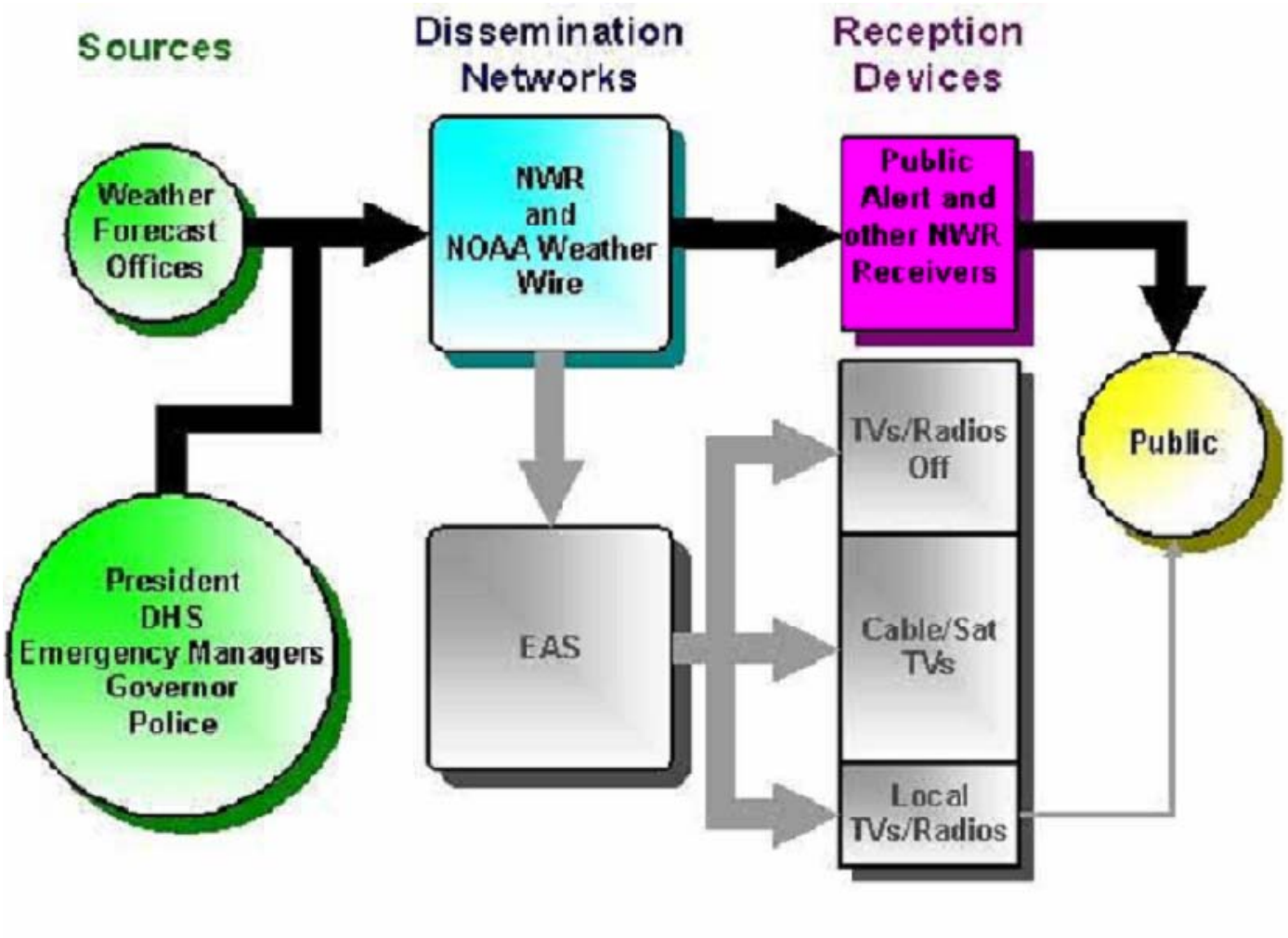
No matter how many resources are put into EAS, 2 out of 3 people will not receive alerts.

Hours Mon.-Sun.	Network TV	Cable TV	Radio	TV/ Radio Off
6:00AM-10:00AM	**6.3%**	**5.2%**	**18.6%**	**69.9%**
10:00AM-4:00PM	**6.9%**	**7.9%**	**19.6%**	**65.6%**
4:00PM-7:00PM	**12.2%**	**9.9%**	**14.8%**	**63.1%**
7:00PM-12:00AM	**19.0%**	**15.1%**	**6.0%**	**59.9%**
12:00AM-6:00AM	**3.4%**	**5.6%**	**2.5%**	**88.5%**

Source: Nielsen Galaxy Explorer, Arbitron DMA Area Fall Nationwide 2003

Time Period: 9/18/2003-12/10/2003

Future with NWR and Public Alert



APPENDIX IV

New Industry Standard for Public Alert Receivers

New Industry Standard for Public Alert Receivers

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ABSTRACT

Recent improvements to the National Oceanic and Atmospheric Administration Weather Radio network are described. Recently announced plans to improve Environment Canada's Weatheradio network are also described. A new voluntary standard that defines performance criteria for products that receive these network signals is explained, and a logo that has been created to indicate compliance with this standard is introduced.

BACKGROUND

The U.S. National Weather Service (NWS) first began broadcasting weather information in 1951 on station KWO55 in New York. Over the years the number of NOAA Weather Radio (NWR) stations has grown significantly and the service has expanded from one that provided only aeronautical and marine weather forecasts to one that provides weather forecasts and other timely information for everyone.

A key enhancement to NWR came in 1988 when the NWS approved Specific Area Message Encoding (SAME) for use nationwide in NWR broadcasts. This technology, which would later be used by the Federal Communications Commission (FCC) as the basis for the Emergency Alert System (EAS), for the first time enabled people with properly equipped receivers to filter out warning messages concerning hazards and geographic locations that were of no interest to them. This made NWR much more user friendly to many people, particularly those who wanted to be alerted about impending danger but did not want to be listening constantly to weather reports. Full scale implementation of SAME was funded by the NWS in 1996 and coincided with the FCC's adoption of the SAME-based EAS for broadcasters. [1]

In recent years NWR has expanded dramatically. Before 1995 there were 398 NWR stations throughout the U.S. As of January 15, 2004, there were 881 stations covering 97 percent of the U.S. population. This growth has been fueled by increased funding resulting from the recognition of the life-saving capability of NWR. Some of this funding has been provided by Congress directly into the NWS budget, some has come through a U.S. Department of Agriculture grant program aimed at expanding NWR in rural areas, and some has come from local organizations who have taken the initiative to build NWR transmission facilities for their communities and gift them to the NWS.

Were the NWS ranked among the group owners of U.S. AM and FM radio broadcasters it would be the largest group owner in terms of population covered, and the second largest in terms of stations owned.

In 2002 a market research project conducted by the Consumer Electronics Association (CEA) found that only 13 percent of U.S. households owned an NWR receiver even though 51 percent of the respondents were aware of NWR. It also found that 41 percent of the respondents would be more likely to purchase an NWR receiver if the receiver incorporated "all hazards" capability, and that 46 percent were interested in receivers that would automatically alert them of potential hazards even if the receiver were turned off. The study concluded that the total market potential for NWR receivers over the next year was 7.1 million units. [2]

To help manufacturers capitalize on the market potential for new NWR receivers CEA established a new "Public Alert" logo and accompanying technical standard to help consumers identify products that can automatically alert them about potential dangers, whether or not their receivers are on. The new technical standard is CEA-2009, *Receiver Performance Specification for Public Alert Receivers*. [3]

NWR TRANSMISSION SYSTEM

There are 121 NWS forecast offices throughout the U.S. and more than 881 NWR transmitters. [4] The forecast offices are staffed by NWS employees and generate NWS forecasts for their areas. Each forecast office is connected to the NWR transmitters in its area by leased telephone lines, UHF radio links, microwave links, or some combination of these.

NWR transmitter sites are designed to provide reliable service even under severe conditions. They have redundant systems that allow continued transmission from a backup transmitter in the event that the main transmitter should fail. They operate 24 hours per day and are typically unattended.

NWR transmitters broadcast narrowband FM signals on 162.400, 162.425, 162.450, 162.475, 162.500, 162.525 or 162.550 MHz. The signals have a maximum deviation of ±5 kHz. For the NWS to consider a

particular area covered by one of its transmitters the area must receive a signal from the transmitter that is no less than 8 μV/m (18 dBu) measured 1.8 m above the ground. To predict coverage for its stations the NWS uses the National Telecommunications and Information Administration (NTIA) Communication Systems Performance Model (CSPM) with three arc-second terrain resolution.

The audio frequency response of NWR transmitters is within +1 and -3 dB of a 6 dB per octave pre emphasis curve from 200 Hz to 5 kHz, and high frequencies in the audio input signal to the transmitter are limited by a 6 dB per octave or greater 5 kHz low pass filter. The pre-emphasis curve is referenced to the 1 kHz level (*i.e.*, the gain at 1 kHz is 0 dB and it increases at a rate of 6 dB per octave with increasing frequency and decreases at a rate of 6 dB per octave with decreasing frequency).

The programming transmitted over NWR is generated using a text-to-speech computer program called SpeechWorks Speechify, which is now marketed by ScanSoft.

The SAME code is also transmitted in the main audio channel. It is the SAME code that enables consumers to customize their weather radio experiences by specifying which alerts they want to receive, and for what locations they want to receive them.

The SAME code is generated using audio frequency shift keying (AFSK) at a data rate of 520.83 bits per second. Logic zero is indicated by a 1562.5 Hz tone, logic one is indicated by a 2083.3 Hz tone, and each bit period is equal to 1.92 milliseconds. The code is transmitted at no less than 80 percent modulation, which means that it is within the range ±4 to ±5 kHz deviation.

There are six elements in a SAME message. These include the preamble, header code, attention signal, voice message, preamble and end-of-message code. The preambles, header code and end-of-message code are transmitted using AFSK, and are the only required elements of all SAME messages. The attention signal and the voice message may or may not be included. An example of a SAME message that might not require a voice message would be a test signal that is transmitted to test the proper operation of the NWR network.

The preambles and end-of-message codes are routine codes that identify the beginning and end of any SAME message. The real intelligence in the message is embedded in the header code. This code includes a three character originator code that generally identifies the origin and type of the SAME message, a three character event code that identifies the event that is the subject of the SAME message, a six character location code that identifies the geographic area to which the SAME message applies, twelve characters that define the start time and duration of the event, and eight characters that define the NWS office that originated the SAME message.

Currently SAME messages are only transmitted when there are special alerts or messages. However, the NWS has future plans to also transmit SAME codes with routine messages such as forecasts and tide reports. This would enable consumer receivers to be designed that could always have the latest forecast for a particular area, and nothing but that forecast, stored in the receiver's memory ready for instant playback whenever the consumer requested it.

PUBLIC ALERT RECEIVERS

NWR receivers have been on the market for many years. Initially they were only capable of playing real time audio from NWR broadcasts whenever the user turned them on. Later, they were capable of being automatically turned on by tones included in NWR programming. In the latter case the receivers were essentially on all the time but with their speakers muted until a tone was broadcast.

The most recent receivers are capable of decoding the SAME codes broadcast by NWR and of using these codes to not only unmute speakers, but to do it only for selected types of alerts for selected geographic areas.

In 2003 a group of manufacturers of NWR receivers got together with representatives of the NWS and Environment Canada to establish a performance standard for NWR and Canadian Weatheradio receivers capable of decoding SAME messages. This work was done within CEA's Audio Systems Committee. The reason for this effort was a desire to ensure that receivers marketed as being useful receiving NWR and Canadian Weatheradio SAME messages were in fact capable of receiving them under standard reception conditions. Ultimately, this group produced CEA-2009, *Receiver Performance Specification for Public Alert Receivers*.

CEA-2009 defines many performance criteria for Public Alert receivers capable of receiving NWR and Canadian Weatheradio SAME messages. The first and most basic of these is a channel numbering scheme for NWR channels. Previously there was some confusion about channel numbers for NWR frequencies because prior printed material had numbered them in a manner other than that of increasing frequency. CEA-2009 defines them in order of increasing frequency.

The standard requires that, when an automatic channel selection method is employed in the receiver, the strongest RF channel must be selected, or the channel

must be selected from among the strongest channels if no single channel is the strongest. Receiver selectivity is required to be at least 50 dB. Spurious signal rejection is also required to be at least 50 dB.

For consumer equipment the 12 dB SINAD sensitivity is required to be no greater than 0.6 μV. For institutional equipment it is required to be no greater than 0.35 μV. SINAD is a measure of signal plus noise and distortion, and a 12 dB SINAD measurement means that the output signal has 25 percent noise and distortion.

When the RF level is at 1 mV and the modulation is a 1 kHz tone at ±3 kHz the audio signal-to-noise ratio must be at least 45 dB. The audio frequency response must comply with a 6 dB per octave de-emphasis curve over the frequency range 300 Hz to 3 kHz, with the 0 dB reference at 1 kHz.

Receivers are required to accurately decode the AFSK SAME messages in NWR and Canadian Weatheradio transmissions 100 percent of the time when the RF signal level at the receiver terminals is 0.5 μV. They are also required to accurately decode these messages 75 percent of the time when the RF signal level is 0.45 μV.

To ensure that Public Alert receivers provide sufficient audible alerts when activated by NWR and Canadian Weatheradio transmissions there is a minimum audio level requirement for alarms. When a siren is activated and its volume control is adjusted to maximum level its sound pressure level (SPL) must be at least 77 dB at one meter, and the frequency range of the siren must be within the range 500 to 1500 Hz.

There is also a requirement that the audio programming reproduced by the receiver meet minimum level requirements. The SPL of the analog audio emanating from the receiver's speaker must be at least 77 dB at one meter when the receiver is receiving an NWR or Canadian Weatheradio signal modulated with a 1 kHz tone at ±3 kHz deviation and the volume control on the receiver is adjusted to the maximum level at which total harmonic distortion plus noise (THD+N) does not exceed ten percent within the frequency range 300-3,000 Hz.

Except for certain receivers with video displays, all AC-powered receivers are required to have battery backup power and to provide a low battery indicator to the user. This requirement does not apply to Public Alert receivers with video displays that are nine inches in diagonal or larger because of the difficulty of providing battery backup power for the video displays.

Receivers that have video displays that are nine inches in diagonal or larger are required to have dedicated series F connectors for their NWR tuners. These connectors must be in addition to any other series F antenna connectors on the device, and their colors must not conflict with CEA-897, *F-Connector Color Coding for Home Television Systems*. Receivers that do not have video displays that are nine inches in diagonal or larger are not required to have connections for external antennas. However, if they do have such connections these connections must use either series F connectors or RCA connectors. Further, the color-coding of series F connectors must not conflict with CEA-897, and the color-coding of RCA connectors must not conflict with CEA-863, *Connection Color Codes for Home Theater Systems*.

If a receiver includes the ability to trigger an external device (*e.g.*, a bed shaker intended to wake up a hearing impaired person) some recommendations are made concerning the physical dimensions of the connector used to provide external triggering. It is up to the manufacturer to choose the exact physical dimensions of the connector, as well as the electrical characteristics of the interface.

A suite of tests is defined to ensure that receivers respond correctly and consistently to all of the possible SAME alert codes. For example, in the event that the geographic code "000000" is transmitted indicating a nationwide alert, all receivers must activate. In addition, if the receiver is programmed to trigger on the geographic code "000000" it is required to alarm when any possible code is transmitted. That is, the standard stipulates that if a consumer programs the receiver to respond to the geographic code "000000" then the receiver must respond no matter what geographic code is transmitted, not only when the code "000000" is transmitted.

The standard defines English, Spanish and Canadian French descriptors for each of the event codes currently defined for SAME messages. While the standard permits user-selected blocking of certain event codes (e.g., a receiver may permit the user to select not to receive "flood watch" messages), there are certain event codes that the receiver is not allowed to permit the user to block. These include biological hazard warning, civil danger warning, civil emergency message, chemical hazard warning, dam break warning, contagious disease warning, emergency action notification, emergency action termination, earthquake warning, immediate evacuation warning, food contamination warning, hazardous materials warning, hurricane warning, industrial fire warning, local area emergency, law enforcement warning, landslide warning, nuclear power plant warning, radiological hazard warning, shelter in-place warning, tornado warning, tropical storm warning, tsunami watch, tsunami warning, volcano warning, wildfire warning and any unrecognized warning. The latter is any event

code ending in "W" that is not recognized as one of the predefined SAME warning codes used by NWR or Canadian Weatheradio. By requiring receivers to trigger on such unrecognized warnings there is a much better chance that, in the future, people with legacy receivers will be alerted in the event that NWR or Canadian Weatheradio add new warning codes to their lists.

There is a recommendation that receivers be capable of storing a minimum of four active events, and of displaying events until their time has elapsed.

For devices that draw their power from AC power supplies there is a recommendation that an audible or visual notification be provided to the user if the receiver fails to decode a SAME message within ten days of continuous operation. Because NWR stations broadcast weekly SAME test messages, no receipt of any messages over a ten-day period could be an indication of a problem with the receiver's operation. For example, the channel may have accidentally been changed to one that is not available locally, or the antenna may have become disconnected. The notification to the user can serve as a prompt to check for such problems.

Public Alert receivers that do not have nine inch diagonal video displays are not required to have color-coded status indicators that indicate the status of the receiver or the type of alert received. However, for those receivers that do have such indicators the standard requires that specific colors be used. A green indicator must be labeled "READY" and be illuminated when the receiver is properly receiving an NWR or Canadian Weatheradio broadcast. A yellow indicator must be labeled "ADVISORY" and illuminated when an ADVISORY level alert is received. An orange indicator must be labeled "WATCH" and illuminated when a WATCH level alert is received. A red indicator must be labeled "WARNING" and illuminated when a WARNING level alert is received. When used these color-coded indicators must blink for at least 60 seconds after an alert is received, or until the user acknowledges the alert, and thereafter they must remain steady until the alert time expires. They are also required to be labeled with capital letters, in a legible font with high-contrast to the background, and to be visible at a minimum distance of 15 feet in a typical well-lighted environment.

For receivers that automatically activate a tone or siren when an alert is received, the tone or siren is required to remain active for at least eight seconds, or until it is silenced by the user. For receivers that automatically unmute the NWR audio when an alert is received the audio has to remain on at least until the EOM code is received, or the user turns it off.

Public Alert receivers with video displays that are nine inches in diagonal or larger have some special requirements associated with them. For setup menus and alert messages these receivers are required to display all event codes with enough characters to ensure that the event can be readily understood and not confused with other events. In addition, they have to be able to display the names of locations that correspond to location codes thereby permitting the user to select a location by name. As with the event codes, the location name must contain enough characters to ensure that the location can be readily understood and not confused with other locations (*e.g.*, counties and cities with similar names must be easily distinguishable). Receivers without video displays may require the user to enter numeric codes corresponding to geographic locations or events for programming purposes.

To assist the hearing impaired, receivers with nine inch or larger video displays are required to have a minimum of four separate indicators such as LEDs to indicate "ready," "advisory," "watch" or "warning" status. These indicators must be independent and capable of being lighted simultaneously or in any combination. They are required to blink for at least 60 seconds following the reception of an alert, or until the alert is acknowledged by the user. After 60 seconds, or after acknowledgement, they are required to remain on steady until the alert expires. When illuminated they must be visible at a minimum distance of 15 feet in a typical well-lighted environment. The reason that lighted indicators are perceived to be necessary to assist the hearing impaired when it comes to Public Alert receivers with video displays, but they are not perceived to be necessary in Public Alert receivers that do not contain video displays, is that it is anticipated that hearing impaired individuals may be regularly viewing devices with video displays (*e.g.*, televisions) and therefore would benefit from lighted indicators. For devices without video displays, however, it is likely that the device will be out of sight on a regular basis. Therefore, lighted indicators will not ensure that consumers are aware of alerts from these devices. For products without video displays it is expected that specialized accessories to assist hearing impaired individuals, visually impaired individuals and others will be designed to connect to Public Alert receivers with external triggering capability.

Receivers with video displays that are nine inches in diagonal or larger are also required to be capable of activating siren and voice type alarms when the receiver is in a standby mode, though activation of the video display upon receiving an alert is optional in standby mode. This requirement ensures that TVs equipped with Public Alert receivers will be able to sound an alarm even when they are "off" (*i.e.*, plugged in but turned off).

CANADIAN WEATHERADIO

Environment Canada's Weatheradio network has 185 transmitters across Canada that together reach over 92 percent of the Canadian population. On January 7, 2004, Environment Canada announced that it will be upgrading its Weatheradio network to include SAME codes. [6] Signals from Canadian Weatheradio transmitters will follow the same technical format as those from NWS transmitters, meaning that Public Alert receivers will be able to work in both countries. Environment Canada expects its network upgrade to be completed before the end of 2004. Environment Canada participated in the development of CEA-2009 and the standard anticipates that Public Alert receivers will be used in both the U.S. and Canada.

THE PUBLIC ALERT LOGO

To help consumers identify products that comply with the new CEA-2009 standard CEA has established a new certification program in which manufacturers may identify such products with the Public Alert logo. The program is voluntary, as is compliance with the standard. Products that receive NWS or Canadian Weatheradio broadcasts but do not meet the requirements in CEA-2009 may still be marketed, but they are not allowed to carry the Public Alert logo. The logo is illustrated in Figure 1.

Figure 1: Public Alert Logo

CONCLUSION

The availability of NWR has increased dramatically since 1995 making the service available to 97 percent of Americans. Increased functionality brought about by the NWS' implementation of SAME encoding has dramatically increased the service's utility. Environment Canada's Weatheradio network reaches 92 percent of Canadians, and its implementation of SAME encoding during 2004 will dramatically increase its utility. To help Americans and Canadians make better use of these valuable resources the consumer electronics industry has created CEA-2009, a voluntary performance standard for products that receive these SAME-equipped transmissions. It has also created a logo program to help consumers identify products that meet this standard.

REFERENCES

[1] National Weather Service; NOAA Weather Radio (NWR) Specific Area Message Encoding (SAME) Specification (Draft); November 28, 2000.

[2] eBrain Market Research; *Weather Radio Interest and Awareness*; August, 2002.

[3] Consumer Electronics Association; *CEA-2009, Receiver Performance Specification for Public Alert Receivers*; December, 2003.

[4] National Weather Service; NOAA Weather Radio (NWR) Transmitters System Specification (Draft); November 29, 2000.

[6] Environment Canada, News Release, January 7, 2004. http://www.ec.gc.ca